

**Protocol of  
“Herouni Mirror Telescope’s Advisory Group” meeting**

Participants: as mentioned (list below)

Date: **24 Mar 2021**

Meeting place: Zoom, online

Discussion format: Q&A

Discussed questions:

1. **Introduction**
2. **Arevik Sargsyan presents the situation with the project**
3. **Movement of axis**
4. **Leonid Gurvits: Is there a chance to attract Armenian Academy of Science on the side of Herouni Center?**
5. **John Sarkissian: Arevik, the antenna wasn’t owned by HUSC, it was owned by another department, correct? What’s the possibility of HUSC taking the ownership of the antenna? Because if we don’t know the owner, who will be the owner of the receiver in that case?**
6. **Next steps**

Participants:

|    | <b>Name</b>         | <b>Institute</b>              | <b>Expertise</b>                                       |
|----|---------------------|-------------------------------|--------------------------------------------------------|
| 1. | Uwe Bach            | MPIFR, DE                     | Effelsberg VLBI friend and EVN TOG chair               |
| 2. | Kees van’t Klooster | ESA/ESTEC- retired            | Radio telescopes and antennas                          |
| 3. | Leonid Gurvits      | JIVE, NL                      | JIVE representative, space science and radio astronomy |
| 4. | Jacob W.M. Bars     | ESO, MPIFR, DE- retired       | Antenna engineering, Professor                         |
| 5. | John Sarkissian     | CASS (Parkes Observatory), AU | Radio telescope operation and development              |
| 6. | Arevik Sargsyan     | HUSC, AM                      | Antenna engineering                                    |

## 1. Introduction

**Uwe Bach:** the draft of the Report for 2020 was sent by me yesterday or 2 days ago. If you have any comments so far, you can still send it to me. Otherwise, we will upload the document into the Wiki and start the new report for 2021.

**Arevik Sargsyan:** Uwe, after completing this Report, will it be signed in any way by members of AG or just by You, as a chief of AG? In order to have that paper as an expertise. This kind of paper is a part of the TOR of AG. **Uwe Bach:** I would sign it.

**Arevik Sargsyan:** Uwe, when do we expect the signed Report? **Uwe Bach:** In the middle of April we can do that. If you exchange John with emails, please keep me in the loop.

## 2. Arėvik Sargsyan presents the situation with the project

Again the same situation: we fight with the Government, with the new Minister of Economy [Vahan Kerobyan]. Can't say that we have any achievements, but crossing fingers, as one of the Vice Prime Ministers will have a visit with us to the site and we are going to organize a special presentation to him. There is no fixed day, it will happen in the coming days. We found people from the Russian Academy of Science, who will send a letter to that VPM and who will support the Herouni Center in the process of organizing the International conference. I'll inform you later about the correct name of that person. That person will be a push element.

Around 2 weeks ago we asked the new chair of the Board of Directors of EVN JIVE, Tiziana Venturi, and she wrote the second support letter from the EVN JIVE directed to the Prime Minister. The letter is well-received, but there is no reaction yet.

We are going to organize another experiment. Perhaps it will take place in the beginning of April, probably next week or in 2 weeks. Based on the list of sources suggested by John Sarkissian, previously we covered just a half of them. Another three sources are now available during the daytime, so we will make measurements and observations. The dish is still fixed, we can't move it in the direction of the declination. It is 1.3-1.5 degrees with not so high accuracy plus from the Zenith. I'll report on the results after the experiment.

All activities on the repair could start only after the governmental decision.

Uwe, please add to the action list of the Report that it is necessary to have an appropriate internet connection there. Previously we calculated the cost and it is possible to do, and it is necessary for us to have the internet as a point of activities.

## 3. Movement of axis

**Kees Van't Klooster:** the axis direction and the movement direction are perpendicular. It is a cardon system. If you talk about the North/South axis, can you move East/West? **Arėvik Sargsyan:** Yes, we can and we did it last time, we fixed the antenna just on the meridian, on the zero of East/West. **Leonid Gurvits:** If only possible to get any reasonable drift scan on the current fixed position, I would not try to move. Mechanical problems require some attention, for sure, but in my opinion the most critical question is to get end-to-end signals. So, to see all the chain of the signal propagation from the feet to whatever (data acquisition system, recorder or

whatever), if that works, that will mean that the telescope is in principle alive. It cannot move, but it is a separate question. Now it requires some electromechanical work. **Arevik Sargsyan:** We had reasonable results at the previous stage, because it was a part of Cygnus X and we repeated that observation. So, we can say that the telescope is alive.

**John Sarkissian:** You can adjust the Zenith angle, right? You can put it to a particular Zenith angle? **Arevik Sargsyan:** Yes. **John Sarkissian:** If you can do it passing right through, that is really great, even if it's a degree.

**Uwe Bach:** You haven't an encoder to read the position, it'll be a very rough estimate. **Arevik Sargsyan:** Last time we used two geodesics instruments - teodoleds. **Uwe Bach:** Before starting to move it, it should have a lubrication or sort of that first, so it will not be dangerous to move it. **Arevik Sargsyan:** You are completely right, Uwe. We checked that. As you remember, we had inspections, and we checked the situation with lubrication of the axis. Even more, we prepared some oil to add there and it worked well, no problem with lubrication. **John Sarkissian:** It'll be easier if the weather is warm there. **Arevik Sargsyan:** I hope the snow will melt during the coming days, we plan the works for the 6th of April. The work will take around 4 hours once all three sources pass. I think there is snow in the dish now, but I hope that rains during the coming days will clean it. Nights are not 0/under 0 now. Or we can clean it by hand.

#### 4. **Leonid Gurvits: Is there a chance to attract Armenian Academy of Science on the side of Herouni Center?**

**Arevik Sargsyan:** We have friends among them, Byurakan Observatory which is a part of the Academy of Science. But we have no signature from the Academy, as before the war [Sep-Nov2020] there were fights with the current Government who wanted to close the Armenian Academy of Science. **Leonid Gurvits:** I would say that it makes even more sense to make friends with them. Because otherwise, if the Government acts against you, against them separately and you don't talk to each other, that's even worse. As far as I know, there is some approach between the Russian and the Armenian Academies of Science and I think they may ask for support from the Russian Academy of Science as well. Which, by the way, is in a very difficult state in its own right, but they will somehow support colleagues from Armenia. In this sense it will be better to unify the front. **Arevik Sargsyan:** Originally Herouni's Institution, the radio-telescope and all of us, we were not inside of the network of the Academy of Science, all were under the Ministry of Economy and were no connection between the institutions. But we will think about that topic. I'll inform you immediately once I receive a letter from the Russian Academy of Science.

**John Sarkissian:** How likely is it that the Government will close the Academy? Is it a rumor? **Arevik Sargsyan:** There was a serious movement before the war. After the war there is no information about that decision. Now the appropriate body prepares a law on higher education and science. Our Academy of Science is opened during the Second World War, in 1943, and even at that time we needed that, the current decision on closing is very stupid. **Uwe Bach:** The decision to close the Academy of Science for the country who wants to develop is very strange to me, this is a place that you should support. **Arevik Sargsyan:** Only 0.25% of yearly GDP goes to science (our GDP is small). **Leonid Gurvits:** Starting from the Soviet Union, by tradition the National Academy of Science is de facto the Ministry of Science (same in Russia). The current Government wants to change that, and it's a quite understandable move in the right direction, but the way it is done is highly destructive. Ideally, the Academy should be an advisory group with some minimal budget, as in many countries. But traditionally it is different: Academy channelizes Government funding to institutes which belong to the Academy. When Arevik says that the now-

called Herouni Center never was a part of the Academy, it means that it was not in the budget of the Academy, it was private. **John Sarkissian:** In Australia, the Academy is a club of scientists who advise.

**5. John Sarkissian: Arevik, the antenna wasn't owned by HUSC, it was owned by another department, correct? What's the possibility of HUSC taking the ownership of the antenna? Because if we don't know the owner, who will be the owner of the receiver in that case?**

[some time ago John Sarkissian kindly promised to provide HUSC with an appropriate band receiver as a gift]

**Arevik Sargsyan:** In any case, you will send it to HUSC. **John Sarkissian:** We can't say that we hope that sometime in the future you'll be able to have rights for the antenna, we have to know who owns and controls it and to find out whether I can send it or not. Because we have to say how and what it will be used for, someone has to sign-off on it. We have to sort it out. **Arevik Sargsyan:** You are completely right. That is why we are waiting now. In the political area our country's situation is very difficult now: the same team goes to elections maybe in June. **John Sarkissian:** I think we live in an interesting time in the world, just in some places is more interesting than in others)) **Arevik Sargsyan:** It's time to move to Mars or elsewhere))

**Uwe Bach:** To put a real receiver makes only sense if the antenna gets repaired in this model. So, kind of effort, you need to cable it, you need to control it, you need to have an infrastructure there. **Leonid Gurvits:** This is why I said previously, that let's concentrate on one thing at a time. The value of getting the signal in a fixed position is to make sure that you can actually put it on the table and report on this as an achievement. But then the immediate next step is of course to make the antenna controllable. **Arevik Sargsyan:** Thank you, Uwe, for the invitation to the Workshop on Radio Receivers (next week), we will participate, it is very interesting and we will study a lot.

## **6. Next steps**

- for Arevik: to do the observations in April, report about it;
- for AG: to have few weeks to analyze the results of the observation, then to meet on May 4;
- for AG: to sign the Report, and to hope that it will help the current situation.